

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Expanding the Economic and Innovation)	Docket No. 12-268
Opportunities of Spectrum Through Incentive)	
Auctions)	

To: Federal Communications Commission
(Filed electronically through ECFS)

REPLY COMMENTS OF CP COMMUNICATIONS PA, LLC

1. CP Communications PA, LLC (“CP Communications”) hereby submits these Reply Comments in response to the Federal Communications Commission’s (“FCC’s” or “Commission’s”) Notice of Proposed Rulemaking released on October 2, 2012 in the above-captioned proceeding.¹ CP Communications is a leading source for the rental of wireless production equipment -- including wireless microphones, wireless in ear monitors, wireless intercom and wireless cueing -- to the broadcast, theatrical, live event, film, corporate, entertainment and other industries. CP Communications filed Initial Comments on January 25, 2013, and is submitting these Reply Comments to respond to certain comments of others whose positions reflect an inadequate understanding of wireless microphone technology.

2. Reply to Comments of WhiteSpace Alliance. CP Communications obviously agrees with the recommendation of the WhiteSpace Alliance (“WSA”) that licensed Part 74 wireless microphones and venues continue to be protected through White Spaces database registration and have priority over all unlicensed uses. However, some of WSA’s other positions with

¹ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357 (2012).

respect to wireless microphones are based on inaccurate assumptions, leading to erroneous conclusions and, thus, unworkable recommendations.²

3. WSA suggests that, in order to promote spectral efficiency, the Commission should mandate a cut-off date for the sale of analog wireless microphones. WSA also recommends improving spectral efficiency by requiring all wireless microphones to “become frequency agile” and capable of dynamically selecting operating spectrum.³ Efficient use of spectrum is certainly in the interest of all users; but as pointed out in CP Communication’s Initial Comments, existing technological and economic impediments make a near term complete transition to digital wireless microphones unworkable.⁴ Leaving aside significantly higher equipment costs, digital technology simply cannot provide for the consistent real-time, interference-free transmission that is critical for many wireless microphone applications. Requiring all wireless microphones to be capable of dynamic spectrum access would only add to cost concerns,⁵ especially for public service organizations which rely upon wireless microphones, such as schools, houses of worship and municipal/government meeting rooms.

² See Comments of WSA at 33–36.

³ Comments of WSA at 33.

⁴ See CP Communications’ Initial Comments at paras. 6–9. Many wireless microphone applications require consistent real-time, interference-free transmissions, which simply cannot be achieved reliably through current or foreseeable digital technology.

⁵ The majority of wireless microphones sold over the last decade are indeed frequency agile in that they are compatible for use across a broad spectrum of many TV channels. On the other hand, dynamic selection of operating spectrum does not exist today. Such a feature would not be achievable except, perhaps, with high-tier professional equipment costing many thousands of dollars per channel and out of the economic reach of many users.

4. WSA's proposal to "sunset" the availability of two reserve channels for wireless microphone use is impractical.⁶ WSA contends that "wireless microphones do not need the [two] reserve channels as they have more than enough non-TV white space channels to choose from."⁷ This conclusion is based on inaccurate claims that "historically, wireless microphones users have coordinated their frequency assignments with broadcasters,"⁸ and "indoor wireless microphone users have also been found to prefer channels that are co-located with another TV broadcast channel that is geographically separated."⁹

5. Wireless microphone users have never "coordinated with" TV broadcasters, nor have they been able to even if desired. TV transmission is a constant high-power transmission (*i.e.*, there is nothing to coordinate), and spectrum is either quiet enough or not quiet enough for wireless microphone use. WSA confuses "coordination" with channel selection to avoid incoming interference, which is what in fact happens. Similarly, WSA's concept that wireless microphone users prefer co-located channels is somewhat misleading. While it is true that using a TV channel that is occupied by a distant TV station often works, the reason is that the channel is vacant at the microphone venue. The point is that wireless microphone users seek out spectrum that has a quiet enough RF noise floor in which to operate, regardless of why the noise floor is low enough.

⁶ Comments of WSA at 34 – 35. It is unclear from WSA's comments whether the "sunset" proposal applies only to unlicensed wireless microphone use in the two reserved channels or also extends to licensed wireless microphone use. CP Communications objects to either interpretation of WSA's "sunset" proposal.

⁷ Comments of WSA at 34.

⁸ *Id.*

⁹ *Id.* at 35.

6. WSA believes that unlicensed wireless microphone users should transition out of the broadcast bands altogether and would be equally well-served if relocated to higher bands (*e.g.*, 3.5 GHz and 4.9 GHz).¹⁰ Wireless microphone operations in general are not workable at frequencies above 1 GHz, because of the way they are worn on the body. Human body RF absorption, especially when the transmitter or receiver is worn on the body itself (*e.g.*, wireless microphone body-pack transmitters, wireless intercom transceivers, wireless in-ear-monitor receivers, etc.), is far too great at frequencies above 1 GHz to propagate effectively. Once wireless microphone devices are hidden under clothing or in costumes (as they often are) and/or subjected to conditions such as perspiration from performers, RF attenuation levels are significant. Under such conditions, even 900 MHz frequencies prove to be problematic. Thus, wireless microphone operations would not be equally well-served by relocation out of the UHF TV spectrum (which has better propagation and less path loss than higher band spectrum) to higher bands.

7. Reply to Comments of Spectrum Bridge, Inc. CP Communications disagrees with Spectrum Bridge, Inc.'s contentions that wireless microphones are "over protected when they are allocated a full 6 MHz TV channel," "should not be allocated more than 200 kHz" and "should be encouraged to use available technologies to reduce this to 50 kHz."

8. Large scale market penetration of white space devices has yet to be achieved so full scale database performance is still an unknown. Accordingly, it is premature to say that wireless microphones are over protected when allocated a full 6 MHz TV channel. An individual wireless microphone of course does not occupy a full 6 MHz channel; but in licensed systems and registered venues, wireless microphones are more likely to utilize scores or hundreds of

¹⁰ *Id.*

frequencies. It becomes very time consuming, if not impossible, to list each and every frequency, especially since changes occur regularly and up to the last minute. Since TV stations are assigned 6 MHz frequency blocks, the only practical way to lay out a channel bandplan at a particular venue is to fit all the channels within as few TV channels as possible. As long as the basic structure of the primary licensed service in the band is the 6 MHz block, that same structure is the most practical approach for wireless microphone deployment.

9. Further, reducing the amount of bandwidth utilized by individual wireless microphones to 50 kHz is simply not workable. Neither analog nor digital RF technologies as understood today (or in the near future) can provide the necessary audio quality (at least 50 Hz-18 kHz) and near-zero latency (less than 2 ms) in 50 kHz of bandwidth.

10. In sum, the Commission has previously recognized the importance of wireless microphones in public gathering places of all kinds and how many activities would be disabled without adequate clear spectrum for microphones. Parties who are anxious to get access to as much spectrum as they can for their own planned White Spaces devices have little incentive to worry about other kinds of users; but the Commission's obligation is to all of the public. It must continue to recognize that wireless microphones and cueing and control devices are also important to activities on which very large numbers of people depend.

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A handwritten signature in blue ink, appearing to read 'Peter Tannenwald', is written over a horizontal line.

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March 12, 2013

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